

Patent Claims

1. Method for arc welding with a consumable electrode under a protective gas for joining parts, whereby the one part made of ductile cast iron and the other part is made of ductile cast iron or steel, and the protective gas contains not only argon but also carbon dioxide and/or oxygen, characterized in that carbon dioxide is present in the protective gas in the range of 1 to 25 vol% and/or oxygen is present in a range of 0.5 to 10 vol% and the remaining volume amount of protective gas consists of argon or an argon-helium mixture.

2. Method as claimed in Claim 1, characterized in that melting rates of more than 4 kg/h, preferably more than 8 kg/h, especially preferably more than 12 kg/h are achieved.

3. Method as claimed in Claim 1 or 2, characterized in that two welding wires are used to produce the joint.

4. Method as claimed in any one of Claims 1 through 3, characterized in that carbon dioxide is added to the protective gas in an amount of 1 to 15 vol% preferably 2 to 10 vol%.

5. Method as claimed in any one of Claims 1 through 4, characterized in that oxygen is present in the protective gas in an amount of 1 to 3 vol%.

6. Method as claimed in any one of Claims 1 through 5, characterized in that nitrogen monoxide is additionally added to the protective gas.

7. Method as claimed in any one of Claims 1 through 6, characterized in that 10 to 60 vol% helium, preferably 20 to 50 vol% helium, especially preferably 30 to 40 vol% helium is added to the protective gas.

8. Method as claimed in any one of Claims 1 through 7, characterized in that a corona arc is used.

9. Method as claimed in any one of Claims 1 through 8, characterized in that a free electrode length of at least 15 mm, preferably at least 18 mm is used.

10. Method as claimed in any one of Claims 1 through 7, characterized in that the method of pulsed arc welding is used.

11. Method as claimed in any one of Claims 1 through 10, characterized in that a wire feed rate of 10 to 50 m/min, preferably 15 to 30 m/min is used.

12. Method as claimed in any one of Claims 1 through 11, characterized in that a wire diameter of 0.8 to 2.0 mm, preferably 1.0 to 1.6 mm is used.

13. Method as claimed in any one of Claims 1 through 12, characterized in that an arc voltage of more than 28 V, preferably in the range of 32 V to 45 V is used.

14. Method as claimed in any one of Claims 1 through 13, characterized in that a current of 220 A to 500 A, preferably 260 A to 450 A is set.

15. Method as claimed in any one of Claims 1 through 14, characterized in that the joint is created from at least two weld layers.

16. Method as claimed in any one of Claims 1 through 15, characterized in that at least the parts made of ductile cast iron are preheated to temperatures of 200°C to 250°C before the welding process.

17. Method as claimed in any one of Claims 1 through 16, characterized in that the parts that are joined are cooled in diatomaceous earth after the welding process.

18. Method as claimed in any one of Claims 1 through 16, characterized in that the joined parts are heated to temperatures between 500 and 900°C for 1 to 3 hours after the welding process.

19. Protective gas mixture for arc welding of ductile cast iron with a consumable electrode containing carbon dioxide and/or oxygen in addition to argon, characterized in that the protective gas mixture contains 1 to 25 vol% carbon dioxide and/or 0.5 to 10 vol% oxygen and the remaining volume amount consists of argon or an argon-helium mixture.

20. Protective gas mixture as claimed in Claim 19, characterized in that the protective gas contains 1 to 15 vol%, preferably 2 to 10 vol% carbon dioxide.

21. Protective gas mixture as claimed in Claim 19 or 20, characterized in that the protective gas contains 1 to 3 vol% oxygen.

22. Protective gas mixture as claimed in any one of Claims 19 through 21, characterized in that the protective gas contains nitrogen monoxide.

23. Protective gas mixture as claimed in any one of Claims 19 through 22, characterized in that the protective gas contains 10 to 60 vol% helium, preferably 20 to 50 vol% helium, especially preferably 30 to 40 vol% helium.

24. Use of a protective gas mixture which contains carbon dioxide and/or oxygen in addition to argon for joining a part made of ductile cast iron to a part made of ductile cast iron or sealed by arc welding with a consumable electrode, characterized in that amounts by volume as claimed in one or more of Claims 19 through 23 are contained in the protective gas mixture.